

REMARKS

Claims 1 and 3 – 5 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

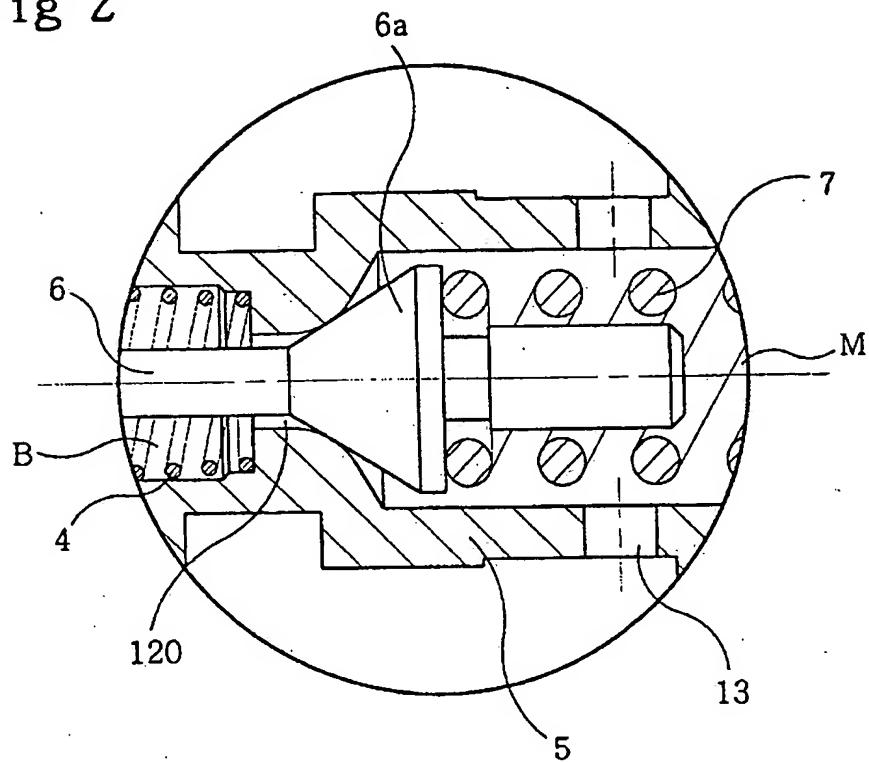
REJECTION UNDER 35 U.S.C. § 103

Claims 1 and 3 – 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over prior art admitted by the applicant in view of Grant (U.S. Pat. No. 5,533,548). This rejection is respectfully traversed.

At the outset, Applicant notes that claim 1 has been amended to include a discharging port which is opened and closed by the pilot poppet, that has an inner arcuately shaped surface having an inner diameter which is gradually increased in the downstream direction and that contacts a linear surface of the pilot poppet when the back pressure chamber is closed. The interface between surface prevents an instant pressure decrease of the fluid which is discharged.

Figure 2 is recreated below to illustrate the surface interface of the claim language.

Fig 2



With regard to claim 1, Applicant respectfully notes that the prior art admitted to by the Applicant fails to teach or suggest an inner arcuately shaped surface having an inner diameter which is gradually increased in the downstream direction and that contacts a linear surface of the pilot poppet when the back pressure chamber is closed.. In fact, Figures 4 – 7 are provided to illustrate the deficiencies of conventional designs in resolving vibration and noise.

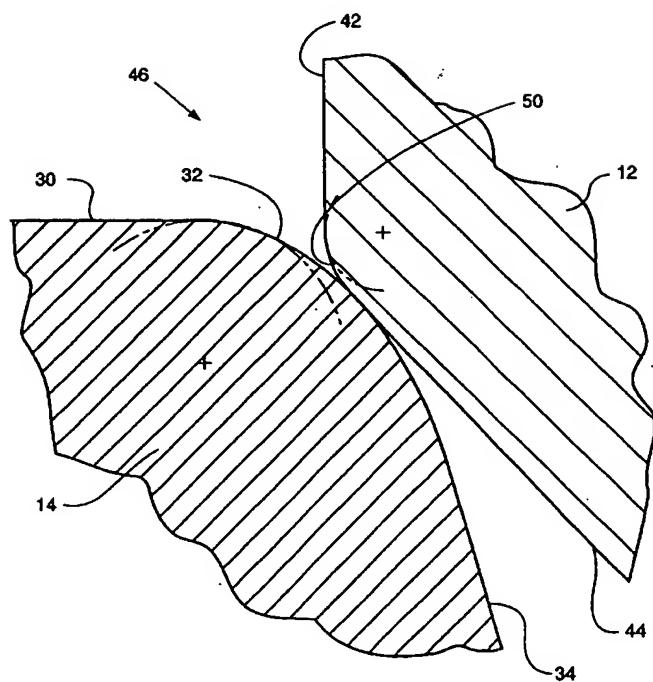
Applicant further notes that Grant fails to cure the deficient teachings of the prior art admitted to by the Applicant. Grant teaches a check valve as opposed to a pressure

control valve including a main poppet which reciprocates in a poppet fixedly inserted in a front end of a sleeve for opening and closing a discharging flow path which connects a high pressure chamber and a low pressure chamber and a pilot poppet which is elastically supported by a first elastic member in an interior in the front end side of a seat engaged to a rear portion of the poppet and is forwardly and backwardly moved for opening and closing a discharging port.

More particularly, Grant fails to teach or suggest a discharging port which is opened and closed by the pilot poppet, that has an inner arcuately shaped surface having an inner diameter which is gradually increased in the downstream direction and that contacts a linear surface of the pilot poppet when the back pressure chamber is closed. Grant explicitly teaches an interface between first and second convex contoured surfaces 32 and 50, respectively (Col. 2, Lines 49 – 63).

Figure 2 of Grant has been recreated below to illustrate the interface between the first and second convex contoured surfaces 32 and 50.

FIG. 2.



As illustrated, the poppet 14 has an end portion 24 having a complex geometry. The end portion 24 includes an end surface 30, the first contoured convex surface 32 and an angled surface 34. The multi-geometrical end portion 24 is more complex and costly to manufacture than the linear surface claimed by Applicant's invention. Therefore, Applicant's invention prevents an instant pressure decrease of discharge fluid by implementing a less costly, simpler geometry.

Accordingly, Grant fails to teach or suggest a discharging port which is opened and closed by the pilot poppet, that has an inner arcuately shaped surface having an inner diameter which is gradually increased in the downstream direction and that contacts a linear surface of the pilot poppet when the back pressure chamber is closed. Therefore, reconsideration and withdrawal of the rejection are respectfully requested.

Claims 3 – 5 depend from claim 1, which defines over the prior art as discussed in detail above. Therefore, claims 3 – 5 also define over the prior art and reconsideration and withdrawal of the rejections are respectfully requested.

OTHER CLAIM AMENDMENTS

Claim 3 has been amended herein for consistency with the amended claim language of claim 1.

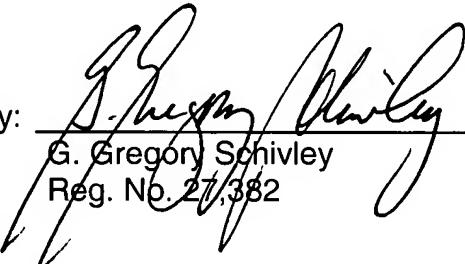
CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: Feb 5, 2004

By:


G. Gregory Schivley
Reg. No. 27,382

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

GGS/RPM